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(56) Documents cited  
EP 0381016 A1 EP 0370965 A2 WO 90/13103 A1  
WO 85/01114 A1 WO 84/04174 A1 US 4694295 A  
US 4450430 A US 4028662 A

(58) Field of search  
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## (54) A motor vehicle blind-spot indicator and warning system

(57) A system for detecting the presence of objects lying within the blind-spot of the vehicle in which it is installed and which indicates the presence of the detected object(s) to the driver of the vehicle on a dashboard display. As well as the visual display the driver also receives an audible warning if there is an attempt to turn into the path of the detected object(s). The system provides information to the driver of the vehicle within the blind-spot to let them know that they have entered the blind-spot of the vehicle in which it is installed and also to warn them if the vehicle attempts to move across their path.

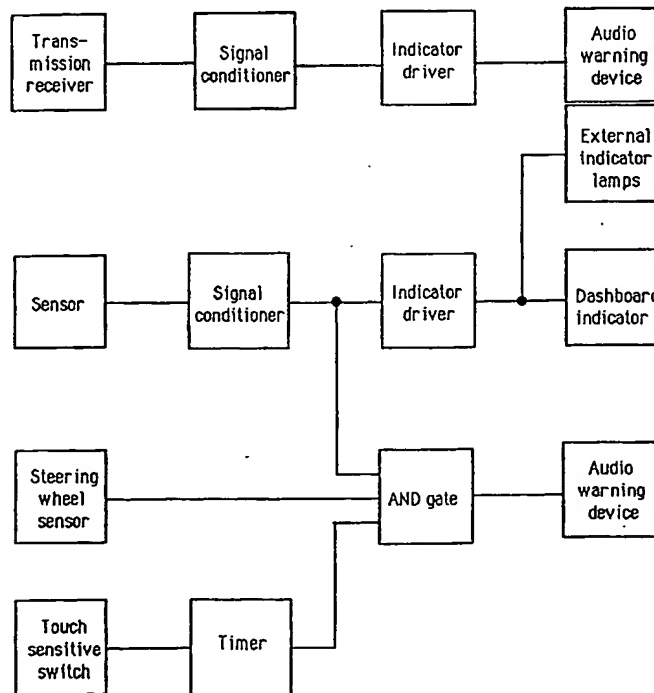


Figure 4 System design

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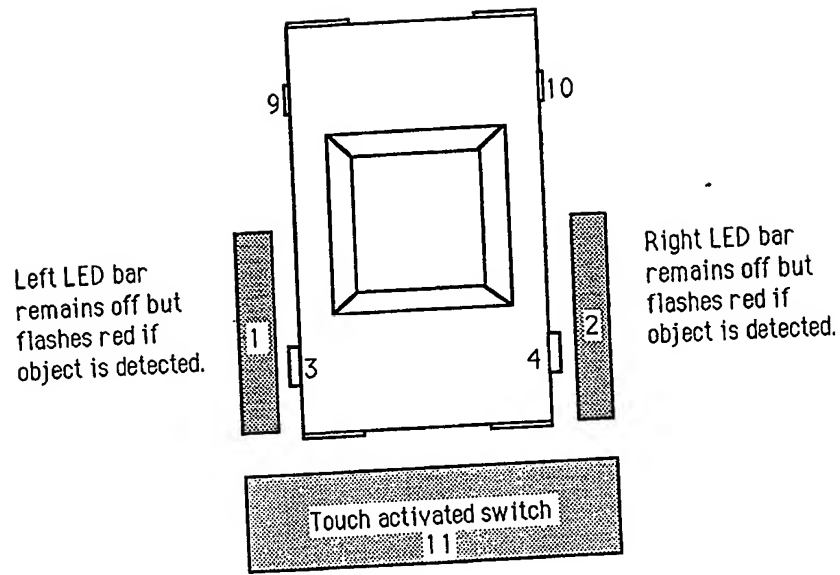


Figure1 Dashboard instrument panel icon

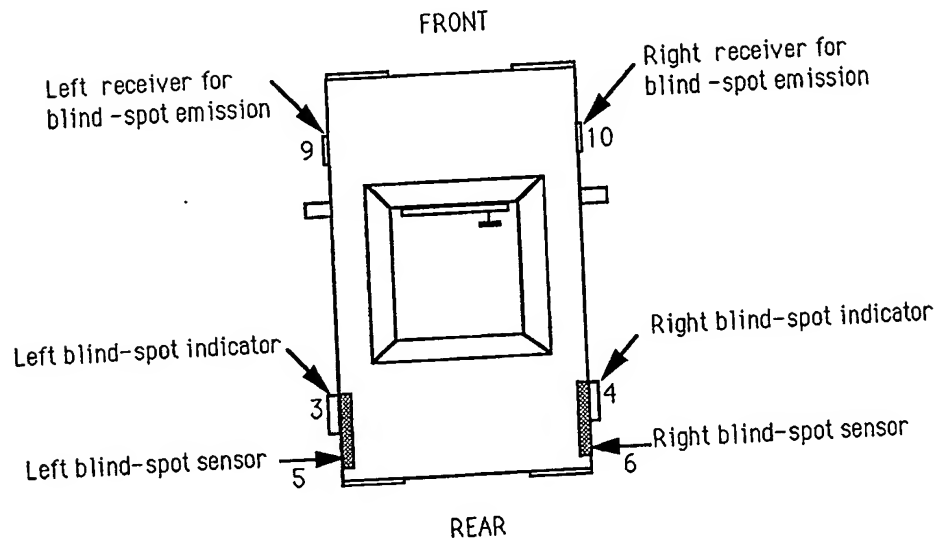


Figure 2 Positions of sensors and receivers on a typical vehicle

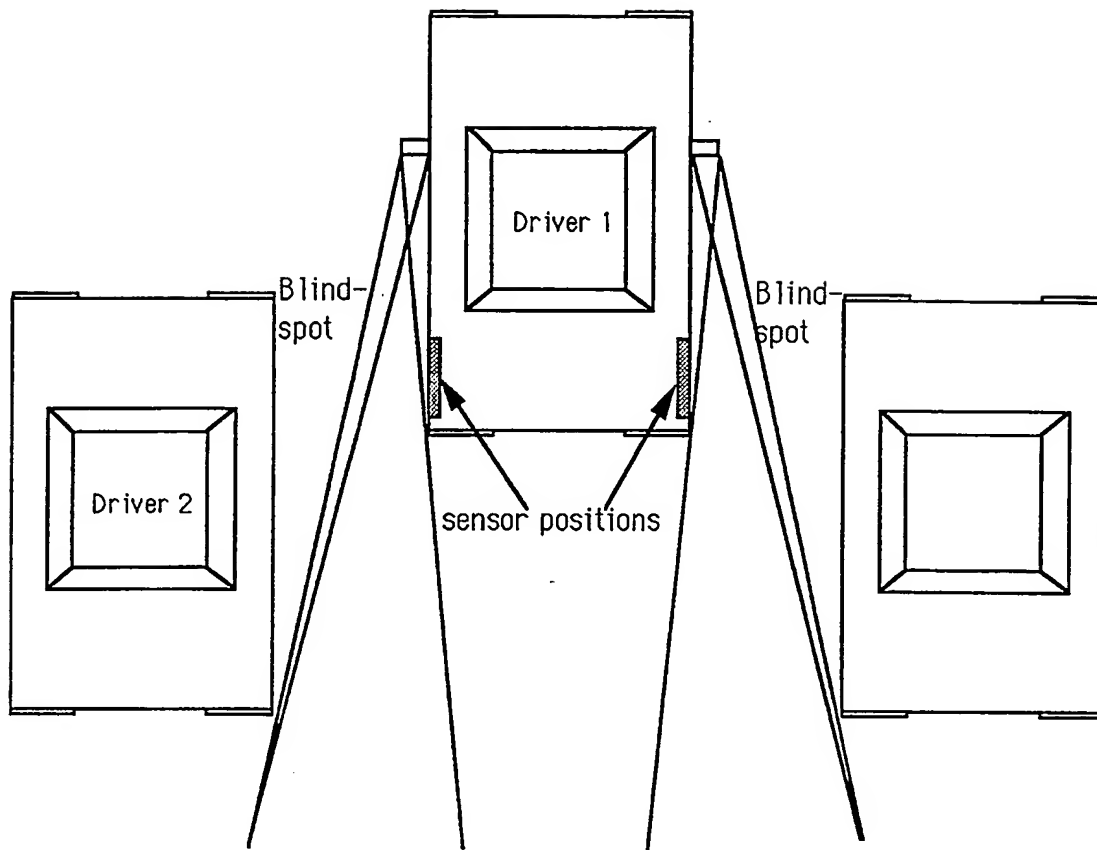


Figure 3 Analysis of the blind-spots within a motor car

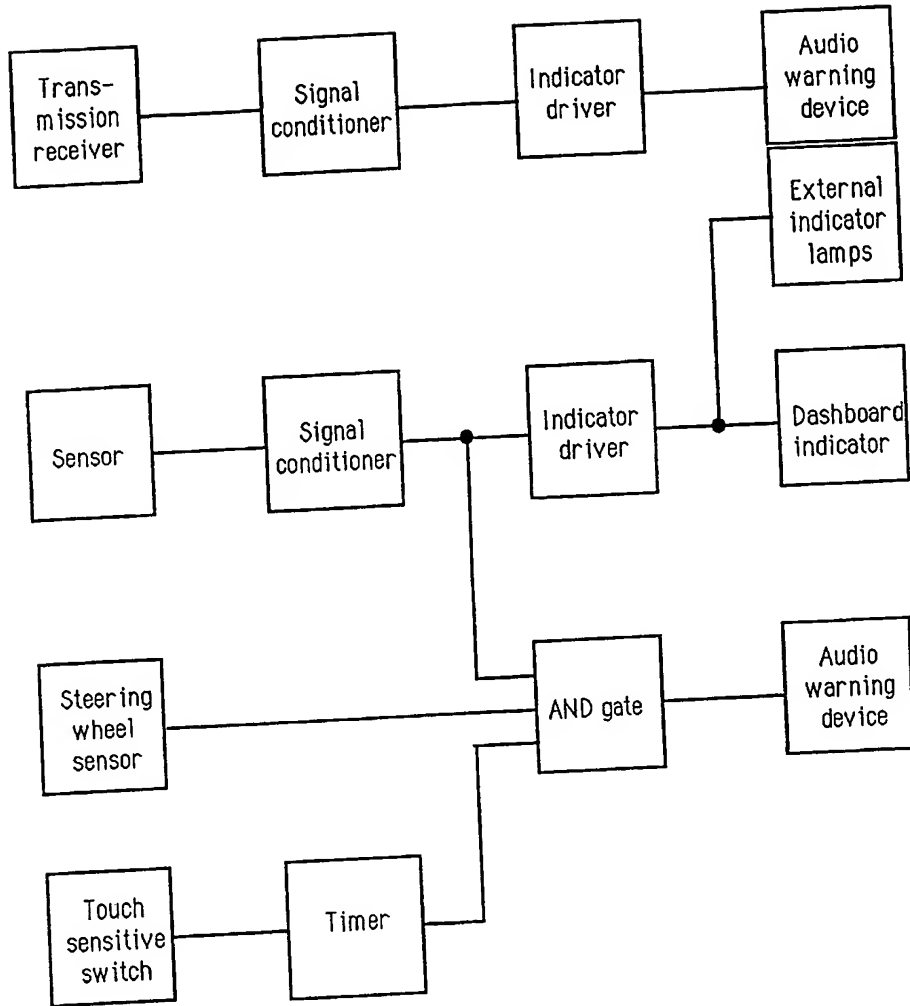


Figure 4 System design

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It would be safe to say that a significant number of accidents on the roads are caused by the drivers being unaware of the presence of objects within an area either side of the vehicle, referred to as the 'blind-spot'. In an ideal world, drivers should look behind them before carrying out any manoeuvre; in reality they often don't do this, with occasional disastrous consequences.

The present invention is a system which provides the following features

- \* For driver 1, it detects the presence of cars, bikes and cyclist which are within the blind-spot of driver 1 (see figure 3).
- \* For driver 1, it indicates the presence of detected objects by a flashing LED display as shown in figure 1.
- \* For driver 1, it gives an audible warning if an attempt is made to turn into the path of the detected object.
- \* For driver 2, it indicates that driver 2 has now entered the blind-spot of driver 1. If a similar device is fitted into the vehicle of driver 2, this will be by a 1 Hz bleep, or else it will be by signal lamps on the rear sides of the vehicle of driver 1.
- \* For driver 2, it indicates if driver 1 begins to drift across the path of driver 2. If a similar device is fitted into the vehicle of driver 2, this will be an accelerating bleep or else it will be by the flashing of the indicator lamp on the side of the vehicle of driver 1.
- \* For driver 1, it will provide a temporary inhibit which deactivates the audible warning for short intervals when the vehicle is moving slowly, but will reactivate it immediately if there is any sudden increase in speed of the vehicle of driver 1.

The system picks up the presence of hidden objects using sensors (at present ultrasonic transmitter/receiver, IR sensor or induction loop proximity sensors are being considered). The sensor will have an adjustable range, up to 4 m and will also be

able to operate in all weather conditions and at high speeds.

Figure 1 This illustrates the dashboard instrument panel icon, for indicating when an object has entered the blind-spot and also to indicate to driver 1 that the blind-spot warning indicator lamps have been switched on.

Figure 2 Illustrates the positions of sensors, receptors and indicators on a typical motor vehicle.

Figure 3 This is an analysis of the blind-spot on a typical vehicle. It also shows where the sensors and rear indicator lamps are likely to be positioned.

Figure 4 Illustrates the system design as it is at present.

Referring to the figures, the system consists of sensors (5) and (6) positioned at the rear sides of the vehicle which picks up the presence of an object. The signals are processed by the electronics of figure 3 and the dashboard indicator(s) (1) and (2) and side indicator(s) (7) and (8) are activated as required. Another sensor picks up signals from the steering column and in conjunction with the information from the blind-spot sensors generates an audible warning. Receivers positioned at the front sides of the vehicle (9) and (10) picks up the emission from the blind-spot sensor transmissions from another vehicle and after the signals are processed, produces the 1 Hz bleeps or the accelerated bleeps as required. A touch activated dashboard switch (11), positioned below the panel icon, allows the audible warning to be temporarily deactivated.

## Claims

- 1 A motor vehicle blind-spot indicator and warning system, consisting of sensors which are able to pick up objects which are within the the blind-spot of the vehicle in which it is installed and which indicates the presence of these objects to the driver of the vehicle with a visual dashboard display, followed by an audible warning if the driver attempts to turn into the path of the detected object(s).
- 2 A motor vehicle blind-spot indicator and warning system as claimed in claim 1 which signals to the driver of the detected vehicle that it is now in the blind-spot of the vehicle in which it is installed.
- 3 A motor vehicle blind-spot indicator and warning system as claimed in claim 1 or claim 2 which indicates to the driver of the detected vehicle that the vehicle in which it is installed is moving across its path.
- 4 A motor vehicle blind-spot indicator and warning system as claimed in claim 1 which allows the driver of the vehicle in which it is installed to temporarily deactivate the audio warning when required if the vehicle is moving slowly.

-4-

**Patents Act 1977**  
**Examiner's report to the Comptroller under**  
**Section 17 (The Search Report)**

Application number

9207015.0

**Relevant Technical fields**

- (i) UK CI (Edition K) G1A (AMQ); G1G (GPE, GRE);  
 G4N (NHVS) H4D (DLAB, DLPD,  
 DLRA, DLRC, DLRE, DRPC)  
 G01S
- (ii) Int CI (Edition 5)

Search Examiner

Date of Search

**Databases (see over)**

(i) UK Patent Office

(ii) ONLINE DATABASE: WPI

Documents considered relevant following a search in respect of claims 1-4

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X	US 4694295 (MILLER) - see whole document and particularly Column 2 lines 60-66 and Column 9 lines 15-21	1 at least
A	EP 0381016 A1 (HOHE)	1 at least
A	EP 0370965 A2 (ELKRON)	1 at least
A	WO 90/13103 A1 (AUTONSENSE)	1 at least
A	WO 85/01114 A1 (GALLAND)	1 at least
A	WO 84/04174 A1 (BOSCH)	1 at least
A	US 4450430 (BARISHPOLSKY)	1 at least
A	US 4028662 (YOUNG)	1 at least



Category	Identity of document and relevant passages	Relevant to claim(s)

GROUP 1 (A) (B) (C) (D) (E) (F) (G) (H) (I) (J) (K) (L) (M) (N) (O) (P) (Q) (R) (S) (T) (U) (V) (W) (X) (Y) (Z) (AA) (AB) (AC) (AD) (AE) (AF) (AG) (AH) (AI) (AJ) (AK) (AL) (AM) (AN) (AO) (AP) (AQ) (AR) (AS) (AT) (AU) (AV) (AW) (AX) (AY) (AZ) (BA) (BB) (BC) (BD) (BE) (BF) (BG) (BH) (BI) (BJ) (BK) (BL) (BM) (BN) (BO) (BP) (BQ) (BR) (BS) (BT) (BU) (BV) (BW) (BX) (BY) (BZ) (CA) (CB) (CC) (CD) (CE) (CF) (CG) (CH) (CI) (CJ) (CK) (CL) (CM) (CN) (CO) (CP) (CQ) (CR) (CS) (CT) (CU) (CV) (CW) (CX) (CY) (CZ) (DA) (DB) (DC) (DD) (DE) (DF) (DG) (DH) (DI) (DJ) (DK) (DL) (DM) (DN) (DO) (DP) (DQ) (DR) (DS) (DT) (DU) (DV) (DW) (DX) (DY) (DZ) (EA) (EB) (EC) (ED) (EE) (EF) (EG) (EH) (EI) (EJ) (EK) (EL) (EM) (EN) (EO) (EP) (EQ) (ER) (ES) (ET) (EU) (EV) (EW) (EX) (EY) (EZ) (FA) (FB) (FC) (FD) (FE) (FF) (FG) (FH) (FI) (FJ) (FK) (FL) (FM) (FN) (FO) (FP) (FQ) (FR) (FS) (FT) (FU) (FV) (FW) (FX) (FY) (FZ) (GA) (GB) (GC) (GD) (GE) (GF) (GG) (GH) (GI) (GJ) (GK) (GL) (GM) (GN) (GO) (GP) (GQ) (GR) (GS) (GT) (GU) (GV) (GW) (GX) (GY) (GZ) (HA) (HB) (HC) (HD) (HE) (HF) (HG) (HH) (HI) (HJ) (HK) (HL) (HM) (HN) (HO) (HP) (HQ) (HR) (HS) (HT) (HU) (HV) (HW) (HX) (HY) (HZ) (IA) (IB) (IC) (ID) (IE) (IF) (IG) (IH) (II) (IJ) (IK) (IL) (IM) (IN) (IO) (IP) (IQ) (IR) (IS) (IT) (IU) (IV) (IW) (IX) (IY) (IZ) (JA) (JB) (JC) (JD) (JE) (JF) (JG) (JH) (JI) (JJ) (JK) (JL) (JM) (JN) (JO) (JP) (JQ) (JR) (JS) (JT) (JU) (JV) (JW) (JX) (JY) (JZ) (KA) (KB) (KC) (KD) (KE) (KF) (KG) (KH) (KI) (KJ) (KK) (KL) (KM) (KN) (KO) (KP) (KQ) (KR) (KS) (KT) (KU) (KV) (KW) (KX) (KY) (KZ) (LA) (LB) (LC) (LD) (LE) (LF) (LG) (LH) (LI) (LJ) (LK) (LL) (LM) (LN) (LO) (LP) (LQ) (LR) (LS) (LT) (LU) (LV) (LW) (LX) (LY) (LZ) (MA) (MB) (MC) (MD) (ME) (MF) (MG) (MH) (MI) (MJ) (MK) (ML) (MM) (MN) (MO) (MP) (MQ) (MR) (MS) (MT) (MU) (MV) (MW) (MX) (MY) (MZ) (NA) (NB) (NC) (ND) (NE) (NF) (NG) (NH) (NI) (NJ) (NK) (NL) (NM) (NN) (NO) (NP) (NQ) (NR) (NS) (NT) (NU) (NV) (NW) (NX) (NY) (NZ) (OA) (OB) (OC) (OD) (OE) (OF) (OG) (OH) (OI) (OJ) (OK) (OL) (OM) (ON) (OO) (OP) (OQ) (OR) (OS) (OT) (OU) (OV) (OW) (OX) (OY) (OZ) (PA) (PB) (PC) (PD) (PE) (PF) (PG) (PH) (PI) (PJ) (PK) (PL) (PM) (PN) (PO) (PP) (PQ) (PR) (PS) (PT) (PU) (PV) (PW) (PX) (PY) (PZ) (QA) (QB) (QC) (QD) (QE) (QF) (QG) (QH) (QI) (QJ) (QK) (QL) (QM) (QN) (QO) (QP) (QQ) (QR) (QS) (QT) (QU) (QV) (QW) (QX) (QY) (QZ) (RA) (RB) (RC) (RD) (RE) (RF) (RG) (RH) (RI) (RJ) (RK) (RL) (RM) (RN) (RO) (RP) (RQ) (RR) (RS) (RT) (RU) (RV) (RW) (RX) (RY) (RZ) (SA) (SB) (SC) (SD) (SE) (SF) (SG) (SH) (SI) (SJ) (SK) (SL) (SM) (SN) (SO) (SP) (SQ) (SR) (SS) (ST) (SU) (SV) (SW) (SX) (SY) (SZ) (TA) (TB) (TC) (TD) (TE) (TF) (TG) (TH) (TI) (TJ) (TK) (TL) (TM) (TN) (TO) (TP) (TQ) (TR) (TS) (TT) (TU) (TV) (TW) (TX) (TY) (TZ) (UA) (UB) (UC) (UD) (UE) (UF) (UG) (UH) (UI) (UJ) (UK) (UL) (UM) (UN) (UO) (UP) (UQ) (UR) (US) (UT) (UU) (UV) (UW) (UX) (UY) (UZ) (VA) (VB) (VC) (VD) (VE) (VF) (VG) (VH) (VI) (VJ) (VK) (VL) (VM) (VN) (VO) (VP) (VQ) (VR) (VS) (VT) (VU) (VV) (VW) (VX) (VY) (VZ) (WA) (WB) (WC) (WD) (WE) (WF) (WG) (WH) (WI) (WJ) (WK) (WL) (WM) (WN) (WO) (WP) (WQ) (WR) (WS) (WT) (WU) (WV) (WW) (WX) (WY) (WZ) (XA) (XB) (XC) (XD) (XE) (XF) (XG) (XH) (XI) (XJ) (XK) (XL) (XM) (XN) (XO) (XP) (XQ) (XR) (XS) (XT) (XU) (XV) (XW) (XX) (XY) (XZ) (YA) (YB) (YC) (YD) (YE) (YF) (YG) (YH) (YI) (YJ) (YK) (YL) (YM) (YN) (YO) (YP) (YQ) (YR) (YS) (YT) (YU) (YV) (YW) (YX) (YY) (YZ) (ZA) (ZB) (ZC) (ZD) (ZE) (ZF) (ZG) (ZH) (ZI) (ZJ) (ZK) (ZL) (ZM) (ZN) (ZO) (ZP) (ZQ) (ZR) (ZS) (ZT) (ZU) (ZV) (ZW) (ZX) (ZY) (ZZ)

### Categories of documents

X: Document indicating lack of novelty or of inventive step.

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A: Document indicating technological background and/or state of the art.

P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

&: Member of the same patent family, corresponding document.

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